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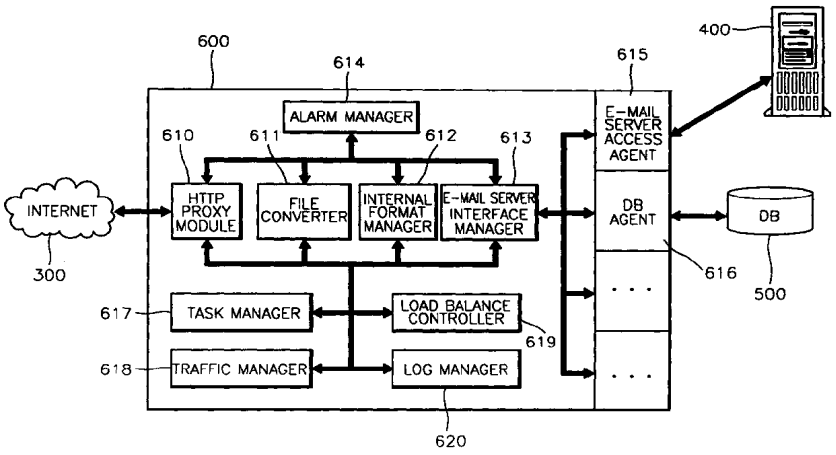
(54) Title: APPARATUS AND METHOD FOR CONNECTING AND SERVING AN E-MAIL USING WIRELESS TERMINAL



(57) Abstract: An apparatus and method for allowing a user to directly receive e-mail and its attachment suc as a Doc file, Hwp file, or Ppt file through his/her wireless terminal at his/her request are provided. In the method, the e-mail server interface manager receives the analysis message and accesses a mail server via an e-mail server access agent and a database agent using a predetermined protocol. Then, the e-mail manager transmits e-mail and its attachments in the mail server to an internal format manager. The internal format manager converts different formats of the e-mail and its attachments into an internal format which is defined previously. Then, a file converter converts the internal format into a format which can be recognized by the wireless terminal and transmits the converted e-mail and attachments to the wireless terminal. If the user ends the receiving operation through the wireless terminal, the HTTP proxy module terminates the access, erases the e-mail and its attachments from the wireless terminal, and waits for another request message. Accordingly, a wireless terminal user can receive any type of e-mail and its attachment through a wireless terminal.

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APPARATUS AND METHOD FOR CONNECTING AND SERVING AN E-MAIL USING WIRELESS TERMINAL

Technical Field

The present invention relates to an apparatus and method for accessing and providing e-mail using a wireless terminal, and more particularly, to an apparatus and method for allowing a user to directly receive e-mail and its attachment such as a Doc, Hwp, Gul or Ppt file through his/her wireless terminal at his/her request even in the case of movement or even in the case where wire communication is impossible so that the user can manage business without limitations of a place and circumstance.

Background Art

Generally, access to an e-mail account through a computer must be allowed in order to perform e-mail service through wire Internet. Internet e-mail service using a wireless terminal can be used through only web servers having an e-mail service provider format which can be used in a computer environment connected to the Internet and in a wireless terminal, and only e-mail accounts having a predetermined format. Accordingly, in order to view e-mail in an Internet e-mail server, a user needs to access the Internet e-mail server using a computer connected to the wire Internet. If the user wishes to view the e-mail in the Internet through a wireless terminal, he/she needs to input the address of a web site having the e-mail and access the Internet through the wireless terminal.

In a web site providing only wireless Internet e-mail, only e-mail having a format suitable for each wireless terminal can be opened. In other words, if the address of a web site having a wireless Internet e-mail account is input, and the web site is accessed, the web site

having wireless Internet e-mail recognizes the access and transmits corresponding e-mail to the wireless terminal. After accessing a wireless Internet server and checking the e-mail through the wireless terminal, if the user ends the access, wireless Internet service ends.

However, such a general method of viewing e-mail in an Internet e-mail server has the following problems.

It is necessary to access the Internet e-mail server through a computer connected to the Internet in order to view e-mail in the Internet e-mail server through the Internet. In addition, when using a wireless terminal, a user can use only limited mail servers. Accordingly, when the user makes a new e-mail account or has many e-mail accounts, he/she cannot receive some e-mail through the wireless terminal. Even if the user accesses a particular e-mail server, he/she cannot view the content of attachments or graphic files.

Disclosure of the Invention

To solve the above-described problems, it is a first object of the present invention to provide an apparatus and method for accessing and providing e-mail using a wireless terminal, thereby allowing a user to view e-mail in any e-mail account as well as e-mail in an e-mail account, which is assigned to the user having a wireless terminal, through the wireless terminal.

It is a second object of the present invention to provide an apparatus and method for accessing and providing e-mail using a wireless terminal, thereby allowing a user to view a file such as a Doc file, an Hwp file, a Gul file, or a Ppt file attached to e-mail through a wireless terminal so that the user can be provided with a convenient working environment.

To achieve the above objects of the invention, there is provided an apparatus for accessing and providing e-mail using a wireless

terminal so that a user can receive e-mail and its attachments including Doc files through the wireless terminal. The apparatus includes an HTTP proxy module for receiving and analyzing an access request from the wireless terminal; an e-mail server interface manager for receiving an analysis message output from the HTTP proxy as the result of analysis and determining whether to access a mail server; an e-mail server access agent for accessing the mail server in response to the determination of the e-mail server interface manager and accessing a database storing e-mail using a predetermined protocol; a database agent for accessing e-mail of the mail server in response to the determination of the e-mail server interface manager and accessing a database storing e-mail using a predetermined protocol; an internal format manager for converting different e-mail formats of e-mail, which the e-mail server interface manager and the database agent fetch from the mail server and transmit to the internal format manager, into an internal format which is defined previously; and a file converter for converting the internal format of the e-mail received from the internal format manager into a format which can be recognized by the wireless terminal. The HTTP proxy transmits the converted e-mail from the file converter to the wireless terminal through Internet.

The apparatus further includes an alarm manager for informing whether each unit operates abnormally; a task manager for controlling and managing each unit; a load balance controller for properly re-distribute many requests from the wireless terminal; a traffic manager for managing traffic when there is a request from the wireless terminal and recording particulars necessary for the user; and a log manager for keeping logs of particulars generated by each unit and using them when necessary.

To achieve the above objects of the invention, there is also provided a method of accessing and providing e-mail using a wireless

terminal so that a user can receive e-mail and its attachments including Doc files through the wireless terminal. The method includes a first step in which a mail server sends a short message to a wireless network system in order to show the content of e-mail and its attachments which are requested by the user through the wireless terminal; a second step in which the wireless network system reports that the short message is recognized to the mail server after the first step; a third step in which the wireless network system transmits a short message delivery point to point (DPP) to the wireless terminal after the second step, and the wireless terminal reports that the short message DPP is recognized to the wireless network system; a fourth step in which the wireless terminal accesses a predetermined Internet site through an auxiliary e-mail server after the third step; a fifth step in which the auxiliary e-mail server requests user information from the wireless terminal after the fourth step, and the wireless terminal sends the user information to the auxiliary e-mail server in response to the request; a sixth step in which after the fifth step, the auxiliary e-mail server authenticates the user information for the mail server, receives acknowledgement of authentication of the user information, and fetches the e-mail and its attachments from the database; and a seventh step in which after the sixth step, the auxiliary e-mail server converts formats of the e-mail with attachments into a format which can be recognized by the wireless terminal and transmits the converted e-mail and attachments to the wireless terminal.

In the seventh step, as much e-mail with attachments as can be shown by the wireless terminal at one time is transmitted to the wireless terminal, and the remaining e-mail with attachments is stored in the auxiliary e-mail server.

In the seventh step, a piece of e-mail with an attachment is divided into a plurality of portions which can each be accommodated by the wireless terminal, and the portions are transmitted to the wireless

terminal one by one, the method further comprising the step in which if the user requests transmission of another piece of e-mail with an attachment, as much e-mail with an attachment as can be accommodated by the wireless terminal is transmitted to the wireless terminal at one time.

To achieve the above objects of the invention, there is provided a method of accessing e-mail service and providing e-mail using a wireless terminal so that a user can receive e-mail with attachments including PDF files, which is stored in an e-mail system and a computer, through the wireless terminal. The method includes a first step in which an HTTP proxy module receives an access request from the wireless terminal, analyzes the access request, and transmits an analysis message to an e-mail server interface manager; a second step in which the e-mail server interface manager receiving the analysis message in the first step determines whether to access the e-mail system and accesses a mail server which stores e-mail via an e-mail server access agent and a database agent using a predetermined protocol; a third step in which the e-mail server interface manager accessing the mail server in the second step fetches e-mail with attachments in the e-mail server and transmits it to an internal format manager; a fourth step in which after the third step, the internal format manager converts different formats of the different types of e-mail with attachments into an internal format which is defined previously; a fifth step in which after the fourth step, a file converter converts the internal format of the e-mail with attachments into a format which can be recognized by the wireless terminal and transmits the converted e-mail with attachments to the wireless terminal through Internet; and a sixth step in which after the fifth step, if the user ends reception of e-mail with attachments through the wireless terminal, the HTTP proxy module terminates the access, erases the e-mail with attachments which has been transmitted to the wireless

terminal, and waits for another request message.

The e-mail with attachments fetched by the e-mail server interface manager in the third step is stored in a wireless data conversion unit, divided into portions having as much amount as can be transmitted to the wireless terminal at one time, and transmitted to the wireless terminal portion by portion.

In the fifth step, the file converter converts formats of the e-mail with attachments fetched from the mail server into a format such as Wireless Application Language (WML), Handheld Device Markup Language (HDML), Compact Hypertext Markup Language (CHTML), SHTML, MHTML, or WBMP which can be recognized by the wireless terminal.

If e-mail fetched from the mail server has an attachment, the file converter converts the attachment into a format which can be recognized by the wireless terminal so that the attachment can be stored in a sub-folder of a corresponding cache folder.

The attachments are classified into a format such as MS Word, HWP, Hunmin chong-um, Johab-hyung Hangul code, Wansung-hyung Hangul code, Unicode, Excel, or PowerPoint and converted by an auxiliary e-mail server so that they can be recognized by the wireless terminal.

Brief Description of the Drawings

Preferred embodiments of the present invention will be described in detail with reference to the attached drawings in which:

FIG. 1 is a diagram of the configuration of an apparatus for accessing and providing e-mail using a wireless terminal according to an embodiment of the present invention;

FIG. 2 is a diagram of an embodiment of an auxiliary e-mail server of an apparatus for accessing and providing e-mail using a wireless

terminal according to the present invention; and

FIG. 3 is a flowchart of a procedure for checking e-mail and its attachment through a wireless terminal in an apparatus for accessing and providing e-mail using a wireless terminal according to the present invention.

Best mode for carrying out the Invention

FIG. 1 is a diagram of the configuration of an apparatus for accessing and providing e-mail using a wireless terminal according to an embodiment of the present invention. FIG. 2 is a diagram of an embodiment of an auxiliary e-mail server of an apparatus for accessing and providing e-mail using a wireless terminal according to the present invention.

Referring to FIGS. 1 and 2, the apparatus includes a wireless terminal 100, a wireless network system 200, Internet 300, a mail server 400, a database (DB) 500, and an auxiliary e-mail server 600.

The wireless network system 200 includes a wire/wireless connecting unit 210. The auxiliary e-mail server 600 includes an HTTP proxy module 610, a filter converter 611, an internal format manager 612, an e-mail server interface manager 613, an alarm manager 614, an e-mail server access agent 615, a DB agent 616, a task manager 617, a traffic manager 618, a load balance controller 619, and a log manager 620.

More specifically, when a user requests to view e-mail through the wireless terminal 100, the HTTP proxy module 610 of the auxiliary e-mail server 600 receives an access request from the wireless terminal 100 via the wireless network system 200 and analyzes the received access request. The e-mail server interface manager 613 receives an analysis message from the HTTP proxy module 610 and determines whether to access an e-mail system (not shown).

The e-mail server access agent 615 accesses the e-mail system in response to a determination by the e-mail server interface manager 613 and accesses the mail server 400, which stores e-mail and its attachments such as text files, moving image files, and PDF files, using a predetermined protocol. The DB agent 616 accesses the mail server 400 in response to a determination by the e-mail server interface manager 613, accesses the DB 500, and fetches e-mail and its attachments using a predetermined protocol.

Once the e-mail server interface manager 613 and the DB agent 616 fetch e-mail and its attachments from the e-mail system, the internal format manager 612 converts different e-mail formats of the e-mail and the attachments received from the e-mail server interface manager 613 and the DB agent 616 into an internal format which is defined previously. Then, the file converter 611 converts the internal format of the e-mail and the attachments received from the internal format manager 612 into a format which can be recognized by the wireless terminal 100 and transmits the converted e-mail and the attachments to the wireless terminal 100 through the Internet 300. In addition, the file converter 611 converts e-mail and its attachments which are fetched from the DB 500 or the mail server 400 to have a format such as Wireless Application Language (WML), Handheld Device Markup Language (HDML), Compact Hypertext Markup Language (CHTML), SHTML, MHTML, or WBMP which can be recognized by the wireless terminal 100. WML is a protocol suitable for the Internet and mobile communication with respect to application services managed through a mobile communication network. HDML is a set of commands and sentences which define how a wireless terminal such as a hand phone or PDA interacts with a user. CHTML, SHTML, and MHTML are a sort of x-HTML which is wireless Internet language. CHTML was adopted by NTT DoCoMo in Japan. SHTML was initiatively developed by Samsung

Electronics and AI Net in Korea. MHTML was initiatively developed by KTF and Hansol M.com in Korea.

In addition, if the e-mail fetched from the mail server 400 has an attachment, the file converter 611 converts the attachment to have a format which can be stored in a sub-folder of a corresponding cache folder. The attachment is classified into a format such as MS Word, HWP, Hunmin chong-um, Johab-hyung Hangul code, Wansung-hyung Hangul code, Unicode, Excel, or PowerPoint and converted so that it can be recognized by the wireless terminal 100.

The alarm manager 614 informs whether each unit operates abnormally. The task manager 617 controls and manages each unit. The load balance controller 619 properly re-distribute many requests from the wireless terminal 100, manages traffic when a request is generated from the wireless terminal 100, and records particulars necessary for the user. The log manager 620 keeps logs of particulars generated by each unit and uses them when necessary.

FIG. 3 is a flowchart of a procedure for checking e-mail and its attachment through a wireless terminal in an apparatus for accessing and providing e-mail using a wireless terminal according to the present invention.

Referring to FIG. 3, in viewing the content of e-mail and its attachments such as text files, moving image files, and Doc files through the wireless terminal 100, once the mail server 400 transmits a short message to the wireless network system 200, the wireless network system 200 reports that the short message has been recognized to the mail server 400.

Here, if the wireless network system 200 transmits a short message delivery point to point (DPP) to the wireless terminal 100, the wireless terminal 100 reports that the short message DPP is recognized to the wireless network system 200 and accesses an Internet site (for

example, http://wms/) through the auxiliary e-mail server 600 in order to show the content of e-mail and its attachments requested by a user.

If the Internet site is accessed through the auxiliary e-mail server 600, the auxiliary e-mail server 600 requests user information such as the user's name and password from the wireless terminal 100, the wireless terminal 100 transmits the user information to the auxiliary e-mail server 600 in response to the request.

Meanwhile, if the auxiliary e-mail server 600 authenticates the user information for the mail server 400 and receives the acknowledgement of the authentication of the user information from the mail server 400, it requests the DB 500 to fetch e-mail and its attachments. If the DB 500 transmits the e-mail and its attachments to the auxiliary e-mail server 600 in response to the request, the auxiliary e-mail server 600 converts formats of the e-mail and its attachments into a format which can be recognized by the wireless terminal 100 (for example, it converts HTML into WML) and transmits the converted e-mail and attachments to the wireless terminal 100. Here, as much e-mail with attachments as can be shown by the wireless terminal 100 at one time is transmitted to the wireless terminal 100, and the remaining e-mail with attachments is stored in the auxiliary e-mail server 600.

In addition, in the case where there is other e-mail and its attachments requested by the user after the wireless terminal 100 receives all the previously requested e-mail and attachments, if the auxiliary e-mail server 600 is requested to send the corresponding e-mail with attachments to the wireless terminal 100, it sends as much e-mail with attachments as can be accommodated by the wireless terminal 100 to the wireless terminal 100.

The scope of the invention will not be restricted to the above embodiments but will be defined by the attached claims.

Industrial Applicability

According to the present invention, a wireless terminal user not only can use e-mail service performed through the existing wire Internet but also can receive any type of e-mail with an attachment such as a Doc file, Hwp file, Gul file, or Ppt file through a wireless terminal. In addition, a service provider can perform e-mail service converted into a format suitable for the user's wireless terminal, thereby providing a convenient working environment to the wireless terminal user.

What is claimed is:

1. An apparatus for accessing and providing e-mail using a wireless terminal so that a user can receive e-mail and its attachments including Doc files through the wireless terminal, the apparatus comprising:

an HTTP proxy module for receiving and analyzing an access request from the wireless terminal;

an e-mail server interface manager for receiving an analysis message output from the HTTP proxy as the result of analysis and determining whether to access a mail server;

an e-mail server access agent for accessing the mail server in response to the determination of the e-mail server interface manager and accessing a database storing e-mail using a predetermined protocol;

a database agent for accessing e-mail of the mail server in response to the determination of the e-mail server interface manager and accessing a database storing e-mail using a predetermined protocol;

an internal format manager for converting different e-mail formats of e-mail, which the e-mail server interface manager and the database agent fetch from the mail server and transmit to the internal format manager, into an internal format which is defined previously; and

a file converter for converting the internal format of the e-mail received from the internal format manager into a format which can be recognized by the wireless terminal and transmitting the converted e-mail to the wireless terminal through Internet.

2. The apparatus of claim 1, further comprising:

an alarm manager for informing whether each unit operates abnormally;

a task manager for controlling and managing each unit;

a load balance controller for properly re-distribute many requests

from the wireless terminal;

a traffic manager for managing traffic when there is a request from the wireless terminal and recording particulars necessary for the user; and

a log manager for keeping logs of particulars generated by each unit and using them when necessary.

3. A method of accessing and providing e-mail using a wireless terminal so that a user can receive e-mail and its attachments including PDF files through the wireless terminal, the method comprising:

a first step in which a mail server sends a short message to a wireless network system in order to show the content of e-mail and its attachments which are requested by the user through the wireless terminal;

a second step in which the wireless network system reports that the short message is recognized to the mail server after the first step;

a third step in which the wireless network system transmits a short message delivery point to point (DPP) to the wireless terminal after the second step, and the wireless terminal reports that the short message DPP is recognized to the wireless network system;

a fourth step in which the wireless terminal accesses a predetermined Internet site through an auxiliary e-mail server after the third step;

a fifth step in which the auxiliary e-mail server requests user information from the wireless terminal after the fourth step, and the wireless terminal sends the user information to the auxiliary e-mail server in response to the request;

a sixth step in which after the fifth step, the auxiliary e-mail server authenticates the user information for the mail server or a database,

receives acknowledgement of authentication of the user information, and fetches the e-mail and its attachments from the database; and

a seventh step in which after the sixth step, the auxiliary e-mail server converts formats of the e-mail with attachments into a format which can be recognized by the wireless terminal and transmits the converted e-mail and attachments to the wireless terminal.

4. The method of claim 3, wherein in the seventh step, as much e-mail with attachments as can be shown by the wireless terminal at one time is transmitted to the wireless terminal, and the remaining e-mail with attachments is stored in the auxiliary e-mail server.

5. The method of claim 3, wherein in the seventh step, a piece of e-mail with an attachment is divided into a plurality of portions which can each be accommodated by the wireless terminal, and the portions are transmitted to the wireless terminal one by one, the method further comprising the step in which if the user requests transmission of another piece of e-mail with an attachment, as much e-mail with an attachment as can be accommodated by the wireless terminal is transmitted to the wireless terminal at one time.

6. A method of accessing e-mail service and providing e-mail using a wireless terminal so that a user can receive e-mail with attachments including Doc files, which is stored in an e-mail system and a database, through the wireless terminal, the method comprising:

a first step in which an HTTP proxy module receives an access request from the wireless terminal, analyzes the access request, and transmits an analysis message to an e-mail server interface manager;

a second step in which the e-mail server interface manager receiving the analysis message in the first step determines whether to

access the e-mail system and accesses a mail server or database which stores e-mail via an e-mail server access agent and a database agent using a predetermined protocol;

a third step in which the e-mail server interface manager accessing the mail server in the second step fetches e-mail with attachments in the e-mail system and transmits it to an internal format manager;

a fourth step in which after the third step, the internal format manager converts different formats of the different types of e-mail with attachments into an internal format which is defined previously;

a fifth step in which after the fourth step, a file converter converts the internal format of the e-mail with attachments into a format which can be recognized by the wireless terminal and transmits the converted e-mail with attachments to the wireless terminal through Internet; and

a sixth step in which after the fifth step, if the user ends reception of e-mail with attachments through the wireless terminal, the HTTP proxy module terminates the access, erases the e-mail with attachments which has been transmitted to the wireless terminal, and waits for another request message.

7. The method of claim 6, wherein the e-mail with attachments fetched by the e-mail server interface manager in the third step is stored in a wireless data conversion unit, divided into portions having as much amount as can be transmitted to the wireless terminal at one time, and transmitted to the wireless terminal portion by portion.

8. The method of claim 6, wherein in the fifth step, the file converter converts formats of the e-mail with attachments fetched from the mail server into a format such as Wireless Application Language (WML), Handheld Device Markup Language (HDML), Compact

Hypertext Markup Language (CHTML), SHTML, MHTML, or WBMP which can be recognized by the wireless terminal.

9. The method of claim 6, wherein if e-mail fetched from the mail server has an attachment, the file converter converts the attachment into a format which can be recognized by the wireless terminal so that the attachment can be stored in a sub-folder of a corresponding cache folder.

10. The method of claim 6, wherein the e-mail and its attachments are classified into a format such as MS Word, HWP, Hunmin chong-um, Johab-hyung Hangul code, Wansung-hyung Hangul code, Unicode, Excel, or PowerPoint and converted by an auxiliary e-mail server so that they can be recognized by the wireless terminal.

FIG. 1

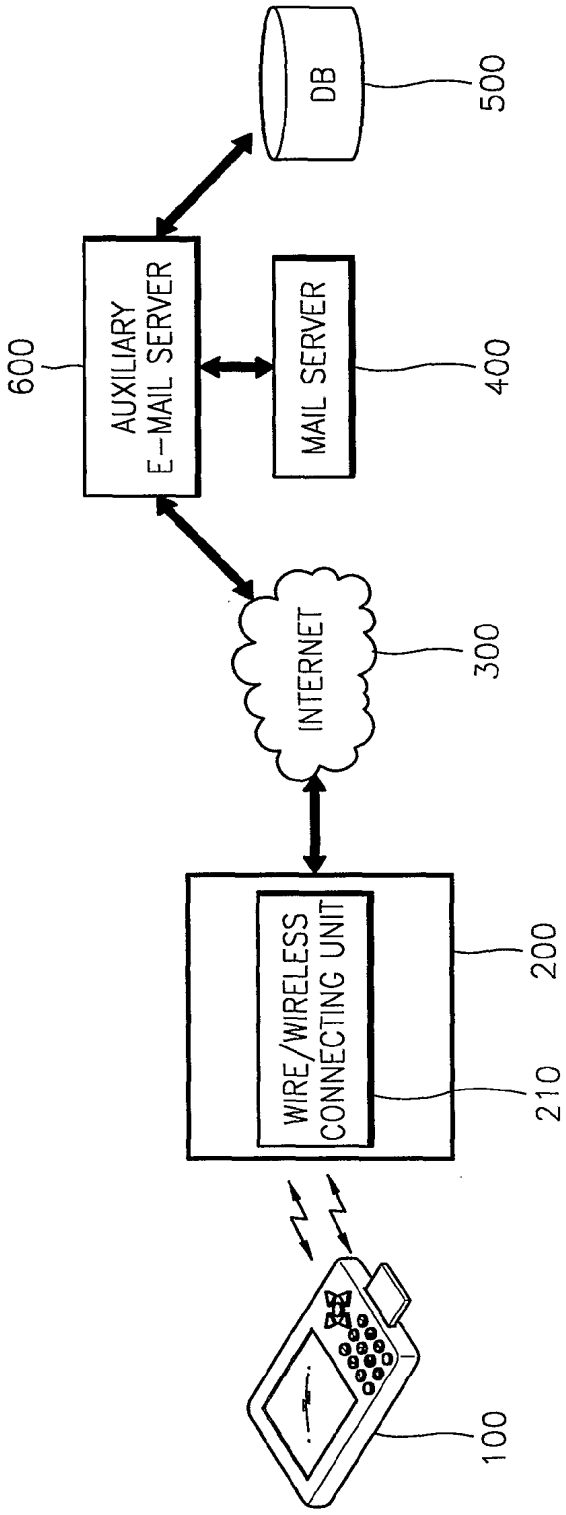
DB
500
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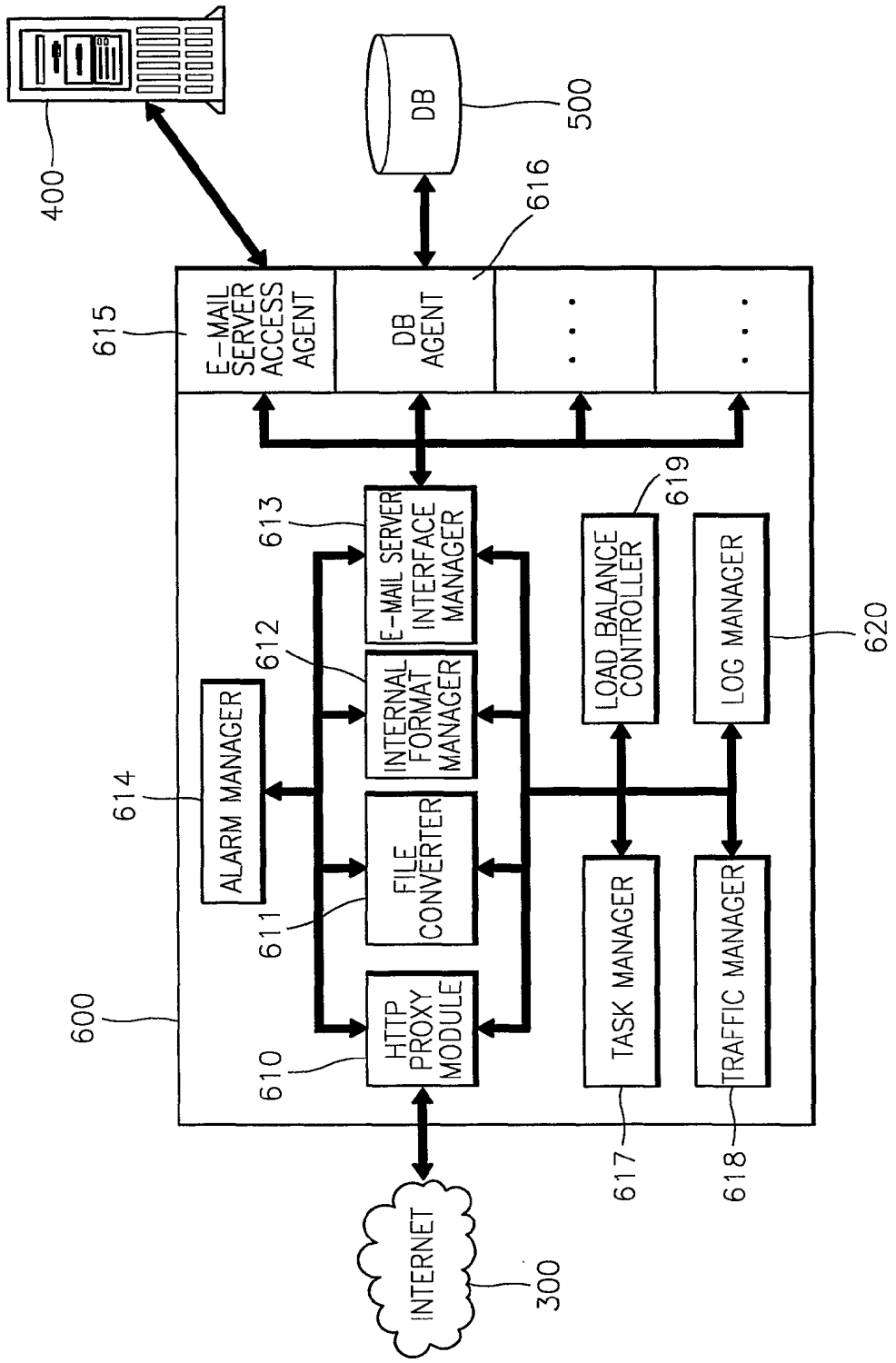
FIG. 2


400
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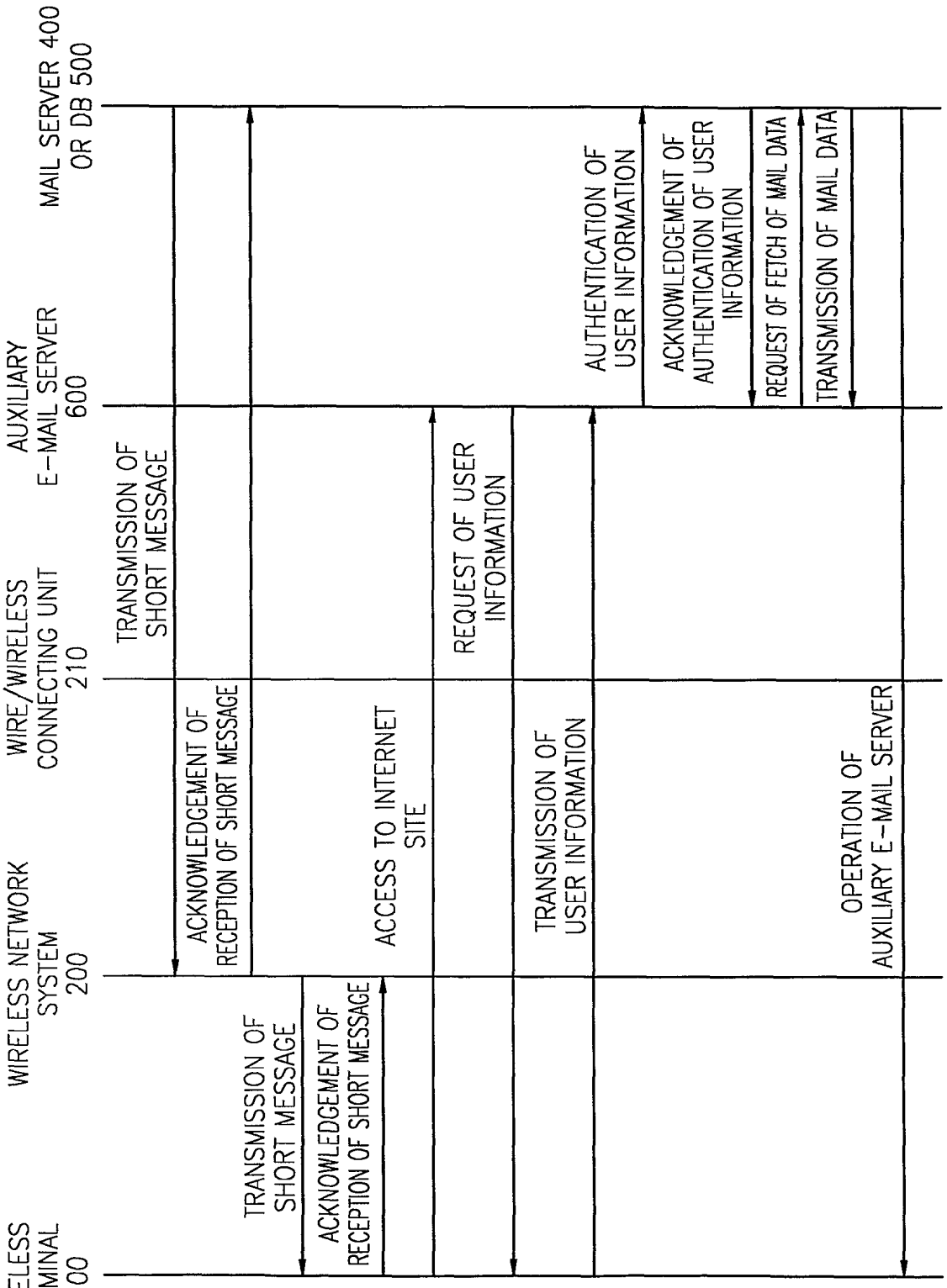
INTERNAL FORMAT MANAGER
614
ALARM MANAGER
611
FILE CONVERTER
610
HTTP PROXY MODULE
600
619
LOAD BALANCE CONTROLLER
LOG MANAGER
620
TASK MANAGER
TRAFFIC MANAGER
617
618
INTERNET
300

FIG. 3


WIRELESS TERMINAL 100
WIRELESS NETWORK SYSTEM 200
WIRE/WIRELESS CONNECTING UNIT 210
AUXILIARY E-MAIL SERVER 600
MAIL SERVER 400 OR DB 500
TRANSMISSION OF SHORT MESSAGE
ACKNOWLEDGEMENT OF RECEPTION OF SHORT MESSAGE
TRANSMISSION OF SHORT MESSAGE
ACKNOWLEDGEMENT OF RECEPTION OF SHORT MESSAGE
ACCESS TO INTERNET SITE
REQUEST OF USER INFORMATION
TRANSMISSION OF USER INFORMATION
AUTHENTICATION OF USER INFORMATION
ACKNOWLEDGEMENT OF AUTHENTICATION OF USER INFORMATION
REQUEST OF FETCH OF MAIL DATA
TRANSMISSION OF MAIL DATA
OPERATION OF AUXILIARY E-MAIL SERVER

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

IPC7 G06F 15/16, G06F 17/30, H04Q 7/24

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimun documentation searched (classification system followed by classification symbols)
G06F 15/16, G06F 17/30

Documentation searched other than minimun documentation to the extent that such documents are included in the fileds searched
KR, JP : IPC as above

Electronic data base consulted during the intertnational search (name of data base and, where practicable, search trerms used)
NEW PATENT & UTILITY SEARCH SYSTEM

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	US 6256666 A (INTERNATIONAL BUSINESS MACHINES CORP.) 3 JULY 2001, see abstract, claims NO.1-2.	1, 3-10
P, Y		2
P, A	US 6023700 A (CRANBERRY PROPERTIES.) 8 FEBRUARY 2000, see abstract	1

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
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